JOURNAL OF AGRICULTURAL RESEARCH

VOL. 77 WASHINGTON 25, D. C. JULY 1–DECEMBER 15, 1948

CONTENTS

	Page
Strains of Cucumber Mosaic Virus Pathogenic on Crucifers. Illus. GLENN S. POUND and J. C. WALKER	1
Production of *Derris elliptica* in Relation to Type of Cutting and Age at Harvest. Illus. DAVID G. WHITE, CALEB PAGÁN, and MERRIAM A. JONES	13
The Effect of Benzene Hexachloride on Soil Organisms. J. K. WILSON and R. S. CHOUDHRI	25
Sesquidiploid F_1 Hybrids of *Lycopersicon esculentum* and *L. peruvianum*. Illus. G. W. BOHN	33
Seasonal Variation of Carotene and Other Nutritionally Important Constituents in the Two Pasture Grasses Dallis and Carpet. J. R. KUPPERS, L. L. RUSOFF, and D. M. SEATH	55
Wild Rice and Its Chemical Composition. RUTH G. CAPEN and J. A. LE CLERC	65
Pod Mottle, a Virus Disease of Beans. Illus. W. J. ZAUMEYER and H. REX THOMAS	81
Horseradish Mosaic. Illus. GLENN S. POUND	97
Antibiotic Substances in Onion in Relation to Disease Resistance. Illus. W. C. HATFIELD, J. C. WALKER, and J. H. OWEN	115
Tests of Sweet Corn Lines for Resistance to European Corn Borer Larvae. MORRIS SCHLOSBERG and W. A. BAKER	137
A Basis for Classifying Soil Permeabilities. Illus. T. W. BENDIXEN, M. F. HERSHBERGER, and C. S. SLATER	157
Predisposition of Tomato to Bacterial Canker. Illus. J. B. KENDRICK, JR., and J. C. WALKER	169
Pollen Compatibility in *Asclepias syriaca*. Illus. F. K. SPARROW and NORMA L. PEARSON	187
Periconia circinata and Its Relation to Milo Disease. Illus. R. W. LEUKEL	201
Auxin Relations in Hot-Water-Treated Sugarcane Stems. Illus. E. W. BRANDES and J. VAN OVERBEEK	223
Growth Potentialities of Vegetative Buds on Apple Trees. Illus. IRMA M. FELBER	239
A Study of Uncongeniality between Peaches as Scions and the Marianna Plum as a Stock. Illus. J. A. MCCLINTOCK	253
Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries. Illus. A. L. NEAL, C. G. BARR, V. R. GARDNER, E. J. RASMUSSEN, and E. J. MILLER	261
A Simple Rapid Method for Estimating Toxicity (Rotenone Equivalent) of Derris Root. Illus. C. PAGÁN and A. J. LOUSTALOT	271
The Inheritance of Partial Thiamine Deficiency in *Lenzites trabea*. Illus. VIRGIL GREENE LILLY and H. L. BARNETT	287
A Pod-Distorting Strain of the Yellow Mosaic Virus of Bean. Illus. RAYMOND G. GROGAN and J. C. WALKER	301
The Relation of Common Mosaic to Black Root of Bean. Illus. RAYMOND G. GROGAN and J. C. WALKER	315

ERRATA AND AUTHOR'S EMENDATIONS

Page 13, senior author's title, "pathologist" should be "physiologist."
Page 39, line 1, last column should read 0.
Page 89, in line 5 under "Reaction of Lima Bean Varieties," "Henderson Bush" should be "Seiva pole lima."
Page 153, table 8, Md.H126, 1938, "+82" should be "−82."
Page 153, table 8, Ia.1248, 1938, "−21" should be "−12."
Page 186, Literature Cited (6) "Hooke" should be "Hooker."
Page 259, par. 3, line 3, "on" should be "or."

INDEX

Page

Antibiotic substances in onion in relation to disease resistance. W. C. Hatfield, J. C. Walker, and J. H. Owen ... 115-135
Antibiotics in juice from onion scales, nature ... 128-129
Apple—
bud—
and leaf, general development on shoot ... 240-243
size, relation to number of leaf primordia ... 243-247
buds—
breaking, relation to size and position ... 250-251
lateral, growth, relation to size ... 247-249
leaf—
and bud, general development on shoot ... 240-243
primordia, number, relation to bud size ... 243-247
leaves and axillary buds, size characters, relationships ... 249-250
trees—
bearing, effect of wax-oil emulsion sprays ... 260-269
vegetative buds, growth potentialities. Irma M. Felber ... 239-252
Apples—
size, effect of oil-wax emulsion sprays ... 268-269
transpiration rate, effect of oil-wax emulsion sprays ... 264, 268
Asclepias syriaca—
crosses, compatibility tests ... 190-193
hand-pollination, method ... 187-190
pollen compatibility. F. K. Sparrow and Norma L. Pearson ... 187-199
umbels, open pollination ... 193-197
Aspergillus niger, toxicity of onion scales to ... 116-135
Auxin relations in hot-water-treated sugarcane stems. E. W. Brandes and J. van Overbeek ... 223-238
Azonopus affinis, constituents, seasonal variation ... 55-62
Azotobacter in soil, effect of crude benzene hexachloride ... 28

Bacterial canker. *See* Canker, bacterial.
BAKER, W. A., and SCHLOSBERG, MORRIS: Tests of Sweet Corn Lines for Resistance to European Corn Borer Larvae ... 137-156
BARNETT, H. L., and LILLY, VIRGIL GREENE: The Inheritance of Partial Thiamine Deficiency in *Lenzites trabea* ... 287-300
BARR, C. G., NEAL, A. L., GARDNER, V. R., RASMUSSEN, E. J., and MILLER, E. J.: Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries ... 261-269
Bean—
black root, relation to common mosaic. Raymond G. Grogan and J. C. Walker ... 315-331
mosaic—
common, relation to black root. Raymond G. Grogan and J. C. Walker ... 315-331
virus, southern, comparison with pod mottle virus ... 81-96
viruses, relationships ... 93
yellow, virus, pod-distorting strain. Raymond G. Grogan and J. C. Walker ... 301-314
necrosis—
caused by insects as vectors ... 327
effect of temperature ... 326-327
plants—
inoculation—
by approach grafts ... 318-322
by hypodermic injection ... 322-324

Page

Bean—Continued
plants—continued
mechanical ... 316-318
with pod-distorting and typical viruses ... 302-303
reaction to virus inoculations ... 324-326
pod mottle—
symptoms ... 83
virus—
disease. W. J. Zaumeyer and H. Rex Thomas ... 81-96
distribution in infected plants and seed transmission ... 90-91
host range ... 89-90
properties ... 91-93
separation from other bean mosaic viruses ... 93-94
technical description ... 95
pod-distorting virus, properties ... 308-309
viruses—
1 and 2, strains, reaction of bean varieties to ... 315-330
comparisons ... 312-313
protection of bean against another virus ... 311-312
transmission by insects ... 310-311
transmission by seed ... 309-310
Beans—
infection with pod mottle, factors affecting ... 83-86
protection against virus by other viruses ... 311-312
susceptibility to pod mottle, tests ... 87-90
transmission of viruses ... 309-310
BENDIXEN, T. W., HERSHBERGER, M. F., and SLATER, C. S.: A Basis for Classifying Soil Permeabilities ... 157-168
Benzene hexachloride—
crude, effect on—
Azotobacter in soil ... 28
growth and nodulation of legumes ... 28-29, 31
growth of pure cultures in test tubes ... 29
population of soil organisms ... 27-28, 31
production of ammonia in soil ... 26-27
effect on soil organisms. J. K. Wilson and R. S. Choudhri ... 25-32
pure isomers, effect on growth of certain organisms ... 30-31
Black root of bean, relation to common mosaic. Raymond G. Grogan and J. C. Walker ... 315-331
BOHN, G. W.: Sesquidiploid F1 Hybrids of *Lycopersicon esculentum* and *L. peruvianum* ... 33-53
Botrytis allii, toxicity of onion scales to ... 116-135
BRANDES, E. W., and VAN OVERBEEK, J.: Auxin Relations in Hot-Water-Treated Sugarcane Stems ... 223-238
Brassica spp., reaction to cucumber mosaic virus strains ... 3, 7, 9, 11
Broccoli, symptoms of horseradish and cabbage mosaic viruses on, effect of temperature ... 107

Canker, bacterial—
development, relation to combinations of air and soil temperatures ... 171-173, 184-185
growth, effect of temperature ... 170-171, 184-185
predisposition of tomato to. J. B. Kendrick, Jr., and J. C. Walker ... 169-186
CAPEN, RUTH G., and LECLERC, J. A.: Wild Rice and Its Chemical Composition ... 65-79

Page

Carotene, seasonal variation in two pasture grasses, Dallis and carpet. J. R. Kuppers, L. L. Rusoff, and D. M. Seath ... 55–63
Carpet grass, carotene and other nutritionally important constituents, seasonal variations. J. R. Kuppers, L. L. Rusoff, and D. M. Seath ... 55–63
Cauliflower, symptoms of horseradish and cabbage mosaic viruses on, effect of temperature ... 108
Cherries, Montmorency, size, influence of oil-wax emulsion sprays. A. L. Neal, C. G. Barr, V. R. Gardner, E. J. Rasmussen, and E. J. Miller ... 261–269
Cherry trees, transpiration rate, effect of oil-wax emulsion sprays ... 263–264, 266–268
CHOUDHRI, R. S., and WILSON, J. K.: The Effect of Benzene Hexachloride on Soil Organisms ... 25–32
Colletotrichum circinans, toxicity of onion scales to ... 116–135
Corn—
  bantam inbred lines, resistance to borers ... 146–151
  borer—
    European, larvae, resistance to by sweet corn lines, tests. Morris Schlosberg and W. A. Baker ... 137–156
    population, factors affecting ... 141–142
    resistance of—
      Bantam inbred lines to ... 146–151
      corn to, determination ... 142–143
      Country Gentleman inbred lines to ... 151–153
      Evergreen inbred lines to ... 153–155
  sweet, lines, resistance to European corn borer larvae, tests. Morris Schlosberg and W. A. Baker ... 137–156
Corynebacterium michiganense. *See* Canker, bacterial.
Crucifers, strains of cucumber mosaic virus pathogenic on. Glenn S. Pound and J. C. Walker ... 1–12
Cucumber mosaic virus pathogenic on crucifers, strains. Glenn S. Pound and J. C. Walker ... 1–12
Cucumber mosaic virus 1 strains—
  classification ... 10, 11
  properties ... 10
  symptoms and host range ... 2–9

Dallis grass, carotene and other nutritionally important constituents, seasonal variation. J. R. Kuppers, L. I. Rusoff, and D. M. Seath ... 55–63
Dames violet, mosaic disease, causal viruses, studies ... 1–11
Derris—
  elliptica, production, relation to type of cutting and age at harvest. David G. White, Caleb Pagán, and Merriam A. Jones ... 13–24
  root, toxicity (rotenone equivalent), estimation by simple rapid method. C. Pagán and A. J. Loustalot ... 271–277
  roots—
    cuttings, different types harvested at various ages, rotenone content ... 13–23
    rotenone yield per acre ... 19

FELBER, IRMA M.: Growth Potentialities of Vegetative Buds on Apple Trees ... 239–252

GARDNER, V. R., NEAL, A. L., BARR, C. G., RASMUSSEN, E. J., and MILLER, E. J.: Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries ... 261–269
Grasses, pasture, Dallis and carpet, seasonal variation of carotene and other nutritionally important constituents. J. R. Kuppers, L. L. Rusoff, and D. M. Seath ... 55–63
GROGAN, RAYMOND G., and WALKER, J. C.: A Pod-Distorting Strain of the Yellow Mosaic Virus of Bean ... 301–314
The Relation of Common Mosaic to Black Root of Bean ... 315–331

Page

HATFIELD, W. C., WALKER, J. C., and OWEN, J. H.: Antibiotic Substances in Onion in Relation to Disease Resistance ... 115–135
Heptachlorocyclohexane, effect on growth of certain organisms ... 30–31
HERSHBERGER, M. F., BENDIXEN, T. W., and SLATER, C. S.: A Basis for Classifying Soil Permeabilities ... 157–168
Horseradish—
  mosaic—
    Glenn S. Pound ... 97–114
    host immunity reactions ... 111–112
    symptoms and host range ... 98–110
    viruses, properties ... 110–111
  symptoms of mosaic viruses on ... 98–99, 107
Hot-water treatment, sugarcane stems, auxin relations. E. W. Brandes and J. Van Overbeek ... 223–238
Hybrids, sesquidiploid F_1, of *Lycopersicon esculentum* and *L. peruvianum*. G. W. Bohn ... 33–53

JONES, MERRIAM A., WHITE, DAVID G., and PAGÁN, CALEB: Production of *Derris elliptica* in Relation to Type of Cutting and Age at Harvest ... 13–24

KENDRICK, J. B., JR., and WALKER, J. C.: Predisposition of Tomato to Bacterial Canker ... 169–186
KUPPERS, J. R., RUSOFF, L. L., and SEATH, D. M.: Seasonal Variation of Carotene and Other Nutritionally Important Constituents in the Two Pasture Grasses Dallis and Carpet ... 55–63

LECLERC, J. A., and CAPEN, RUTH G.: Wild Rice and Its Chemical Composition ... 65–79
Legumes—
  growth and nodulation, effect of crude benzene hexachloride ... 28–29, 31
  inoculation with typical bean- and pod-distorting viruses ... 303–308
Lenzites trabea—
  colored cultures, growth with and without thiamine ... 297–298
  diploints, partial thiamine deficiency ... 292–293
  isolates—
    growth and pH changes ... 289–291
    partial thiamine deficiency of original haploints ... 291–292
    thiamine deficiency, partial, inheritance. Virgil Greene Lilly and H. L. Barnett ... 287–300
    variability ... 293–295
LEUKEL, R. W.: *Periconia circinata* and Its Relation to Milo Disease ... 201–222
Light intensity, effect on predisposition of tomato to bacterial canker ... 182
LILLY, VIRGIL GREENE, and BARNETT, H. L.: The Inheritance of Partial Thiamine Deficiency in *Lenzites trabea* ... 287–300
LOUSTALOT, A. J., and PAGÁN, C.: A Simple Rapid Method for Estimating Toxicity (Rotenone Equivalent) of Derris Root ... 271–277
Lycopersicon—
  esculentum—
    sesquidiploid F_1, hybrids. G. W. Bohn ... 33–53
    See also Tomato.
  peruvianum, sesquidiploid F_1, hybrids. G. W. Bohn ... 33–53
  spp. and hybrid, diploid and tetraploid, self- and cross-pollination, results ... 37–50

Marmor valvolarum n. sp., technical description ... 95
McCLINTOCK, J. A.: A Study of Uncongeniality between Peaches as Scions and the Marianna Plum as a Stock ... 253–260
Milkweed. See *Asclepias syriaca*.
MILLER, E. J., NEAL, A. L., BARR, C. G., GARDNER, V. R., and RASMUSSEN, E. J.: Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries ... 261–269
Milo disease, relation to *Periconia circinata*. R. W. Leukel ... 201–222

Page

Mosaic, common, relation to black root of bean. Raymond G. Grogan and J. C. Walker ... 315-331
Mottle virus. *See* Bean pod mottle virus.

NEAL, A. L., BARR, C. G., GARDNER, V. R., RASMUSSEN, E. J., and MILLER, E. J.: Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries ... 261-269
Nicotiana glutinosa, symptoms of horseradish and cabbage mosaic viruses on, effect of temperature ... 108-110, 111
Nodule bacteria, effect of crude benzene hexachloride ... 29

Oil-wax—
emulsion sprays—
influence on size of apples ... 268-269
influence on size of Montmorency cherries. A. L. Neal, C. G. Barr, V. R. Gardner, E. J. Rasmussen, and E. J. Miller ... 261-269
effect on photosynthesis ... 268
effect on rate of transpiration of plant materials ... 263-264, 266-268
Onion—
antibiotic substances in, relation to disease resistance. W. C. Hatfield, J. C. Walker, and J. H. Owen ... 115-135
black mold, relation to—
outer scale extract ... 126-128
variety ... 122-123
disease resistance, relation to antibiotic substances. W. C. Hatfield, J. C. Walker, and J. H. Owen ... 115-135
fleshy tissue, antibiotic components and volatile sulfur contents, relation to disease index ... 123-126
juice, antibiotics in, nature ... 128-129
neck rot, relation to variety ... 121-122
smudge—
relation to outer scale character ... 129-130
relation to variety ... 118-121
VAN OVERBEEK, J., and BRANDES, E. W.: Auxin Relations in Hot-Water-Treated Sugarcane Stems ... 223-238
OWEN, J. H., HATFIELD, W. C., and WALKER, J. C.: Antibiotic Substances in Onion in Relation to Disease Resistance ... 115-135

PAGÁN, C., and LOUSTALOT, A. J.: A Simple Rapid Method for Estimating Toxicity (Rotenone Equivalent) of Derris Root ... 271-277
PAGÁN, CALEB, WHITE, DAVID G., and JONES, MERRIAM A.: Production of *Derris elliptica* in Relation to Type of Cutting and Age at Harvest ... 13-24
Paspalum dilatatum, constituents, seasonal variation ... 55-62
Pasture grasses—
carotene and other nutrient contents, seasonal variation ... 55-62
Dallis and carpet, seasonal variation of carotene and other nutritionally important constituents. J. R. Kuppers, L. L. Rusoff, and D. M. Seath ... 55-63
Peach scions, uncongeniality to Marianna plum stock. J. A. McClintock ... 253-260
Peaches, grafting to plum stocks, uncongeniality ... 253-260
PEARSON, NORMA L., and SPARROW, F. K.: Pollen Compatibility in *Asclepias syriaca* ... 187-199
Periconia circinata—
effect on milo ... 205-217
relation to milo disease. R. W. Leukel ... 201-222
technical description ... 218-219
Plant-growth regulator, auxin, relations in hot-water-treated sugarcane stems ... 223-238
Plum stocks, Marianna, uncongeniality to peach scions. J. A. McClintock ... 253-260
Pod mottle. *See* Bean pod mottle.
Pollen compatibility in *Asclepias syriaca*. F. K. Sparrow and Norma L. Pearson ... 187-199
POUND, GLENN S.:
Horseradish Mosaic ... 97-114
and WALKER, J. C.: Strains of Cucumber Mosaic Virus Pathogenic on Crucifers ... 1-12
Pyrausta nubilalis. *See* Corn borer.

Page

Pythium arrhenomanes, effect on milo ... 204-205

RASMUSSEN, E. J., NEAL, A. L., BARR, C. G., GARDNER, V. R., and MILLER, E. J.: Influence of Oil-Wax Emulsion Sprays on Size of Montmorency Cherries ... 261-269
Rice, wild—
and its chemical composition. Ruth G. Capen and J. A. LeClerc ... 65-79
chemical analyses ... 70-78
harvesting, curing, and threshing ... 66-67
parched and unparched, physical differences ... 67-69
Rotenone—
equivalent of derris root toxicity, estimation by simple rapid method. C. Pagán and A. J. Loustalot ... 271-277
production, relation to type of cutting and age of derris at harvest ... 13-23
RUSOFF, L. L., KUPPERS, J. R., and SEATH, D. M.: Seasonal Variation of Carotene and Other Nutritionally Important Constituents in the Two Pasture Grasses Dallis and Carpet ... 55-63

SCHLOSBERG, MORRIS, and BAKER, W. A.: Tests of Sweet Corn Lines for Resistance to European Corn Borer Larvae ... 137-156
SEATH, D. M., KUPPERS, J. R., and RUSOFF, L. L.: Seasonal Variation of Carotene and Other Nutritionally Important Constituents on the Two Pasture Grasses Dallis and Carpet ... 55-63
Sesquidiploid F_1 hybrids of *Lycopersicon esculentum* and *L. peruvianum*. G. W. Bohn ... 33-53
SLATER, C. S., BENDIXEN, T. W., and HERSHBERGER, M. F.: A Basis for Classifying Soil Permeabilities ... 157-168
Soil—
ammonia, production, effects of crude benzene hexachloride ... 26-27
moisture, effect on predisposition of tomato to bacterial canker ... 179-182
organisms—
effect of benzene hexachloride on. J. K. Wilson and R. S. Choudhri ... 25-32
population, effect of crude benzene hexachloride ... 27-28, 31
permeabilities, classification basis. T. W. Bendixen, M. F. Hershberger, and C. S. Slater ... 157-168
permeability classification, present status ... 166-167
temperature and air temperature combinations, effect on development of bacterial canker in tomato ... 171-173
Soils—
Coastal Plains, permeability, classification ... 159, 164, 166
Missouri, permeability, classification ... 165-166
Ohio, permeability, effect of structure ... 161
pore-space and percolation measurements, relation to descriptive classes of permeability ... 161-165
SPARROW, F. K., and PEARSON, NORMA L.: Pollen Compatibility in *Asclepias syriaca* ... 187-199
Sugarcane—
buds and stems, gravity effects, modification by treatment ... 227-232
development, stimulation by hot-water treatment, analysis ... 223-238
growth modifications, development, stimulation by hot water treatment ... 224-227
nodes, hot-water-treated, auxin in, analysis ... 233-237
stems, hot-water-treated, auxin relations. E. W. Brandes and J. van Overbeek ... 223-238

Temperature—
effect on—
growth of bacterial canker in tomato ... 170-179, 184-185
horseradish mosaic symptoms ... 107-110
pod mottle lesions on beans ... 86-87
predisposition of tomato to bacterial canker ... 173-179
soil and air combinations, effect on development of bacterial canker in tomato ... 171-173

	Page
Thiamine deficiency, partial, in *Lenzites trabea*, inheritance. Virgil Greene Lilly and H. L. Barnett	287–300
THOMAS, H. REX, and ZAUMEYER, W. J.: Pod Mottle, a Virus Disease of Beans	81–96
Tomato—	
aneuploid varieties, possibility	51
plant, predisposition to bacterial canker, effect of age	183–184
predisposition to bacterial canker. J. B. Kendrick, Jr., and J. C. Walker	169–186
See also *Lycopersicon*.	
Tomatoes, breeding for ascorbic acid and disease resistance	33–52
Uncongeniality between peaches as scions and the Marianna plum as a stock. J. A. McClintock	253–260
Vegetative buds on apple trees, growth potentialities. Irma M. Felber	239–252
Virus disease of beans, pod mottle. W. J. Zaumeyer and H. Rex Thomas	81–96
WALKER, J. C.:	
and GROGAN, RAYMOND G.:	
A Pod-Distorting Strain of the Yellow Mosaic Virus of Bean	301–314
The Relation of Common Mosaic to Black Root of Bean	315–331
and KENDRICK, J. B., JR.: Predisposition of Tomato to Bacterial Canker	169–186
and POUND, GLENN S.: Strains of Cucumber Mosaic Virus Pathogenic on Crucifers	1–12
HATFIELD, W. C., and OWEN, J. H.: Antibiotic Substances in Onion in Relation to Disease Resistance	115–135
WHITE, DAVID G., PAGÁN, CALEB, and JONES, MERRIAM A.: Production of *Derris elliptica* in Relation to Type of Cutting and Age at Harvest	13–24
WILSON, J. K., and CHOUDHRI, R. S.: The Effect of Benzene Hexachloride on Soil Organisms	25–32
ZAUMEYER, W. J., and THOMAS, H. REX: Pod Mottle, a Virus Disease of Beans	81–96